IV. *Account of a Book.* La Meridiana del Tempio de S. Petronio, *&c. i. e. The Meridian Line of the Church of St.* Petronio *drawn and fitted for Aſtronomical Obſervations in the Year* 1655. *reviſed and reſtored in the Year* 1695. *by Signior* John Dominico Caſſini, *Primary Aſtronomer of the School of* Bononia, *Pontificial Mathematician, of the Royal Academy of Sciences, and R.S. Printed at* Bononia 1695. *in Twenty Two Sheets in Fol.*

IN this Book (written in part by Signior *Caſſini*, whilſt in *Italy*, but augmented and publiſhed by Signior *Dominico Guglielmini* after his departure thence) there is an Account given of the Occaſion of the making of this Meridian Line by *S. Caſſini*, in the Year 1655. of the Method of doing it, and of the Exactneſs with which it was performed at that time by him: Then of the Uſes that have been made of it, and of the Alterations that have happened to this Church ſince that time, and of the Reſtauration and Verification of it in the Year 1695. by the ſaid Signior *Caſſini* himſelf; and laſtly, of the Uſes that may be made of it for the future.

To this Diſcourſe, which was written by Signior *Caſſini* himſelf, is adjoined a Diſcourſe of Signior *Dominico Guglielmini*, Mathematician and Publick Lecturer of *Bononia*, giving an Account of the Operations made, and of the Inſtruments imployed in this laſt Reſtauration of the ſaid Meridian Line.

The Royal Society is collaborating with JSTOR to digitize, preserve, and extend access to *Philosophical Transactions (1683-1775).* www.jstor.org

In the firſt Section *S. Caſſini* ſays, this Verification was the more conſiderable, *Firſt*, becauſe it fell out to be made the Year before the laſt Intercalation of the Gregorian Account (which was firſt eſtabliſhed in the Year 1582. Since which time no Intercalation has been omitted, but the firſt is to be omitted in the Year 1700. to reduce the Anticipation of the Equinoctials ſince that time, and ſo to make the Day of the Vernal Equinox to be the 21th of *March*) By which opportune Occurrence, this Line would afford a proper means to obſerve exactly the time of the Sun's Ingreſs into *Aries*, or of its paſſing the Equinoctial Circle. *Secondly*, Becauſe it would be a means for determining a Controverſy now much agitated among learned Men; to wit, Whether the Poſitions of the Meridians and Parallels of Places on the Surface of the Earth, do really alter or not. For that not only the preſent Poſtures of them are found very differing from thoſe aſſigned them by the ancient Geographers: But conſiderable Differences are alſo found out amongſt the more modern Obſervations, as in the preſent Meridian of *Uranibarg*, which has lately been found by Monſieur *Picart*, *Eraſmus Bartholinus*, and others, to vary 18 Minutes towards the Eaſt, from that fixed by the Noble *Tycho Brahe*, about 100 Years ſince. And the great Pyramid of *Egypt* has been very lately found to ſtand in a Poſture that Two of its ſides do reſpect the South. Now Signior *Caſſini* having found by this laſt Rectification of his Meridian Line, that both the Meridian and Parallel of *Bononia*, have not been altered or changed now after 40 Years ſpace, conceives that there has not ever been any ſuch Alteration as is ſuppoſed, but that thoſe Differences that have been found at diſtant times, have been occaſioned by the Defects or Miſtakes of the Obſervations themſelves: Whence he conceives that the accurate Aſtronomer, *Tycho*, was miſtaken in the

Poſition of the Meridian of *Uraniburg*. And as to the preſent Poſition of the Pyramid, he ſuppoſes it was at firſt ſo placed. But becauſe, notwithſtanding his Obſervations, he found that many were of a contrary Sentiment, and that it had partly been occaſioned by a Meridian formerly fix'd in this Church, he in the next Section gives an Account of that old Meridian Line: and the occaſion of the firſt making of this (he ſays) was for the rectifying the time of *Eaſter*, and the Feaſts of the Church which depend upon the true time of the *Vernal Equinox*. For the Prelates of *Alexandria* (who when deputed by the Council of *Nice* to ſtate that time) found it then to be on the 21th of *March*. But Pope *Gregory* being informed that in his time it fell on the 11th of that Month, he altered the Julian Account, and made the 11th to be the 21th of the ſame Month. This was the occaſion that *Ignatio Dante* (Publick Lecturer of Mathematicks at *Bononia*) firſt made a Meridian Line in the Pavement of the Church of St. *Petronio*, in the Year 1575. Seven Years before the Alteration made of the *Julian* Account, and the eſtabliſhment of the *Gregorian*, in the Year 1582. But this Line of *Dante*'s having been found to vary from the true Meridian of the Place, and ſo to be ſerviceable only for the obſerving of the Solſtices (it varying 8 or 9 Degrees from the North towards the Eaſt) and it being ſuppoſed to be ſo miſplaced at firſt by reaſon of the Obſtruction of the Pillars of that Church, was the occaſion of Signior *Caſſini*'s finding a fitter Place in the ſame Church, and of fixing there his new Meridian Line, in the Year, 1655. the Place where, and the manner how, he has more particularly and fully expreſſed in this Diſcourſe. And becauſe it was of ſo conſiderable, and as it were, of Sacred uſe to the Church (the Feaſts thereof depending on the Rectification of the time made by it) he names all the eminent Aſtronomers, who were his Concomitants and Aſſiſtants in the Operations, as Witneſſes of the Exactneſs of them. After this (he relates ſeveral Variations that have happened to the Fabrick, ſince he firſt fixed this his Meridian Line, and thereby ſhews the Neceſſity and Uſe of the Reſtauration and adjuſting of it for the time to come, by which any farther Alteration that may happen to that Building, or otherwiſe for the Future, may be ſo far diſcovered and remedied, and the eſſential parts of this Line ſo far reſtored and rectified, that they ſhall be as effectual, as if no Alteration had happened.

ed. The Uſes of which will be not only to ſhow the true time of the Sun's ingreſs into the Tropick and Equinoctial Points, but likewiſe into all the other Eight Signs; and ſo will ſerve for the verifying and rectifying of the Calendar, the ſame being now ſo placed, as that the Perpendicular height of the Hole, by which the Light is admitted (which is an Inch in Diameter) is 1000 Inches of the Pariſian Foot above the Pavement, and the Meridian Line, which is as a Tangent to it, has the Tangent of 45 Degrees actually divided into 100000 Parts upon one of the Marble Cheeks that border the Ruler or Lath of Iron that expreſſes the Meridian Line in the Floor of the Church, and upon the other Cheek of Marble are marked the Degrees, *&c.* of the Diſtance of the Sun from the Zenith, whereon are alſo marked the Places of the Signs of the Ecliptick. From the Obſervations made by this Line, Sig. *Caſſini* calculated his Tables of Refractions, which have been ſince verifyed by many other Obſervations, both of himſelf and others.

Theſe Conſiderations induced the Sentors of *Bononia* (who had the Care of the Edifice of St. *Petronio* committed to them) to be at the Charge of repairing the ſaid Meridian Line, and to take care that it ſhould be preſerved for the future. For which intent they not only cauſed the Inſtruments made uſe of in the fixing this Line to be ſafely preſerved, but they alſo deſired Signior *Guglielmini* to make ſo perfect a Deſcription of them, that in caſe of their Decay, it might be known how to ſupply and make uſe of them for this Purpoſe for the future. Which intention and Deſire the ſaid learned Profeſſor has fully proſecuted and compleated in his Diſcourſe ſubjoined to that of Signior *Caſſini*, and he hath alſo added ſome uſeful Tables, as that of the parts of the Radius, anſwering to the Diviſions of the Tangent into Degrees, Minutes, *&c.* *Secondly*, Thoſe of the Refractions and Parallaxes of the Sun at ſeveral Altitudes. *Thirdly*, A Table of Declination of every Point of the Ecliptick, anſwering to the Minutes of Declination for the preſent Obliquity of the Ecliptick, which he makes to be 23°. 29′. 12″. He adds alſo, That he himſelf by acurate Obſervations, finds the height of the Pole at that Church to be 44°. 30′. 15″. which is 1′. 15″. greater than what S. *Caſſini* had found it in the Year 1655. All which Particulars, and divers other very remarkable, may be found in the Book it ſelf, to which therefore I refer the Reader.

V. A